PB89-187645

1985 National Biennial Report of Hazardous Waste Generators and Treatment, Storage and Disposal Facilities Regulated Under RCRA (Resource Conservation and Recovery Act). Volume 1: Summary

(U.S.) Environmental Protection Agency
Washington, DC

Mar 89

U.S. Department of Commerce
National Technical Information Service
NTIS

United States
Environmental Protection
Agency

Office of Solid Waste
Office of Policy, Planning,
and Information
Washington, DC 20460

EPA/530-SW-89-033A
March 1989

PB89-187645

Solid Waste

EPA

1985 National Biennial Report of Hazardous Waste Generators and Treatment, Storage and Disposal Facilities Regulated Under RCRA

Volume I: Summary

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U.S. DEPARTMENT OF COMMERCE
NATIONAL TECHNICAL INFORMATION SERVICE
SPRINGFIELD, VA. 22161

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. EPA/530-SW-89-033A	2.	3. Recipient's Accession No. PB89 187645/AS
4. Title and Subtitle 1985 NATIONAL BIENNIAL REPORT OF HAZARDOUS WASTE GENERATORS AND TREATMENT, STORAGE AND DISPOSAL FACILITIES REGULATED UNDER RCRA (VOLUME I: SUMMARY)			5. Report Date MARCH 1989
			6.
7. Author(s) OPPI/OSW			8. Performing Organization Rept. No
9. Performing Organization Name and Address U.S. EPA Office of Solid Waste 401 M. Street SW Washington, DC 20460			10. Project/Task/Work Unit No.
			11. Contract(C) or Grant(G) No. (C) (G)
12. Sponsoring Organization Name and Address			13. Type of Report & Period Covered BIENNIAL REPT - 3/89
			14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

The Summary report (Vol. I) focuses on national and regional analyses and findings. Various regional and national hazardous waste generation and management patterns are highlighted in this volume as documentedin the study's data library.

17. Document Analysis a. Descriptors

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report)	21. No. of Pages
RELEASE UNLIMITED	UNCLASSIFIED	35
	20. Security Class (This Page) UNCLASSIFIED	22. Price PC$13.95 / MF $6.95

(See ANSI-Z39.18)

OPTIONAL FORM 272 (4-77)
(Formerly NTIS-35)

PREFACE

This report was prepared under the direction of the Office of Solid Waste, U.S. Environmental Protection Agency (EPA) by DPRA Incorporated. The study's report is divided into two volumes:

> "1985 National Biennial Report of Hazardous Waste Generators and Treatment, Storage and Disposal Facilities Regulated Under RCRA" (December 1988)
>
> Volume I: Summary
>
> Volume II: Methodology and Data

The Summary report overviews national, regional and limited state-by-state analyses of the generator and facility data that were provided by the states (and territories) in their "State Biennial Program Reports" for 1985 or alternate reporting formats. The Methodology and Data report provides a more detailed assessment of the study's survey approach and data, particularly state-by-state data profiles and relationships among the states. The computer data base utilized in the study comprises the EPA 1985 Biennial Report SAS Data Library located at EPA's National Computing Center, Research Triangle Park, NC.

Although each state's hazardous waste generation and management data are profiled in this report, it focuses on regional and national level analyses. Historically, it has been difficult to obtain uniform and consistent data among all the states; the "1985 Biennial Report" provides more comprehensive and improved data over earlier 1981 and 1983 studies. Additional needed improvements are recognized and being addressed in EPA's planning efforts. Overall, however, the 1985 Biennial Report is regarded by EPA as a benchmark for future comparative analyses of hazardous waste generation and management data.

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LIST OF ABBREVIATIONS

BR	biennial report
CFR	Code of Federal Regulations
CMA	Chemical Manufacturers Association
DL	data library
EP	extraction procedure (EP toxic waste)
EPA	Environmental Protection Agency
GAO	General Accounting Office
HSWA	Hazardous and Solid Waste Amendments (of 1984)
HW	hazardous waste
HWDMS	hazardous waste data management system
LQG	large quantity generator
NCC	National Computing Center (EPA's North Carolina facility at Research Triangle Park)
OSW	Office of Solid Waste
OTA	Office of Technology Assessment
QA/QC	quality assurance/quality control
RCRA	Resource Conservation and Recovery Act
SAS	Statistical Analysis System
SIC	Standard Industrial Classification
SQG	small quantity generator
TSD	treatment, storage, and disposal
TSDR	treatment, storage, disposal, and recycle

SELECTED DEFINITIONS

Regulated Waste Generated: Includes hazardous wastes regulated under Federal and state statutes by large quantity generators and some small quantity generators (SQGs) where states regulate SQGs

RCRA Regulated Waste Generated: Includes RCRA listed and characteristic wastes, exclusive of state regulated hazardous waste

Regulated Waste Managed: Includes hazardous wastes managed by all RCRA and state-regulated TSD facilities.

RCRA Regulated Waste Managed: Includes RCRA listed and characteristic wastes managed at on-site and off-site facilities. Wastes management units included:

- Storage (S01 to S04)
  - Containers
  - Tanks
  - Waste Piles
  - Surface Impoundments
- Disposal (D79 to D84)
  - Injection Wells
  - Landfills
  - Land Treatment
  - Ocean
  - Surface Impoundments
  - Other
- Treatment (T01 to T04)
  - Tanks
  - Surface Impoundments
  - Incinerators
  - Other
- Recycling (R01)

1985 NATIONAL BIENNIAL REPORT OF HAZARDOUS WASTE GENERATORS AND TREATMENT, STORAGE AND DISPOSAL FACILITIES REGULATED UNDER RCRA

VOLUME I: SUMMARY

This two-volume report summarizes the primary data gathered by EPA for the 1985 Biennial Report on RCRA-regulated hazardous waste generation and management activities in the U.S. Specifically, the reporting procedures for the Biennial Report require that generators (except small quantity generators) and TSD facilities provide data on those wastes that are defined as hazardous in Part 261 of the 40 Code of Federal Regulations (CFR). The data gathered provide the most comprehensive national summary view yet of (1) the number of RCRA-regulated hazardous waste generators and their generated wastes, and (2) the number of TSD facilities and the wastes they manage.

The Summary report (Volume I) focuses on national and regional analyses and findings while the Methodolgy and Data report (Volume II) presents the more extensive state data profiles upon which the national and regional results are based. Various regional and national hazardous waste generation and management patterns are highlighted in the Summary volume as documented in the study's data library. The Methodology and Data volume expands upon these aggregate-level analyses by profiling key hazardous waste generation and management data for all fifty states and three territories.

METHODOLOGY

RCRA-regulated hazardous waste generators and TSD facilities in all states, the District of Columbia, Puerto Rico and Guam completed and submitted data

forms to state and EPA regional offices describing their 1985 waste management practices. (Figure 1 outlines the 10 EPA regions and designates the states and territories associated with each region.) To improve the survey's data uniformity, EPA utilized codes to identify the wastes and those handling methods employed in 1985 by RCRA-regulated hazardous waste TSD facilities. The data from these completed forms were then entered into specific State Biennial Program Report formats by individual states or by the Agency's regional offices and forwarded to EPA for processing and incorporation into the present study.

Some reporting entities, however, found it difficult to use the specified EPA format, and their data, reported in various formats, required interpretation and modification by the contractor. Steps used to aggregate the individual state and territorial summary submissions into the present national report included (1) a visual check for completeness, (2) an examination for consistency, (3) a request to appropriate states to provide missing data or resolve report inconsistencies, (4) the creation of a national data base, (5) a review of resultant state summaries by their respective states and EPA regional offices and (6) an aggregation of the individual, edited summaries into the current national summary as presented in this report.

Figure 2 depicts the basic 1985 Biennial Report data system from the facility level (generators and TSD facilities) at the base of the pyramid to the state level (an intermediate level of aggregation) and to the national level at the top of the pyramid. Each state or EPA region representing a state was the focal point for resolving data inconsistencies either at the state level or the facility level within the applicable state. Only in exceptional cases did the contractor develop computer files directly from facility level survey forms. Also, some states utilized approved alternate survey forms that required special handling. Overall, the primary study objective was to generate a consistent set of state data bases from the State Biennial Program Report (or alternative survey forms) for 1985

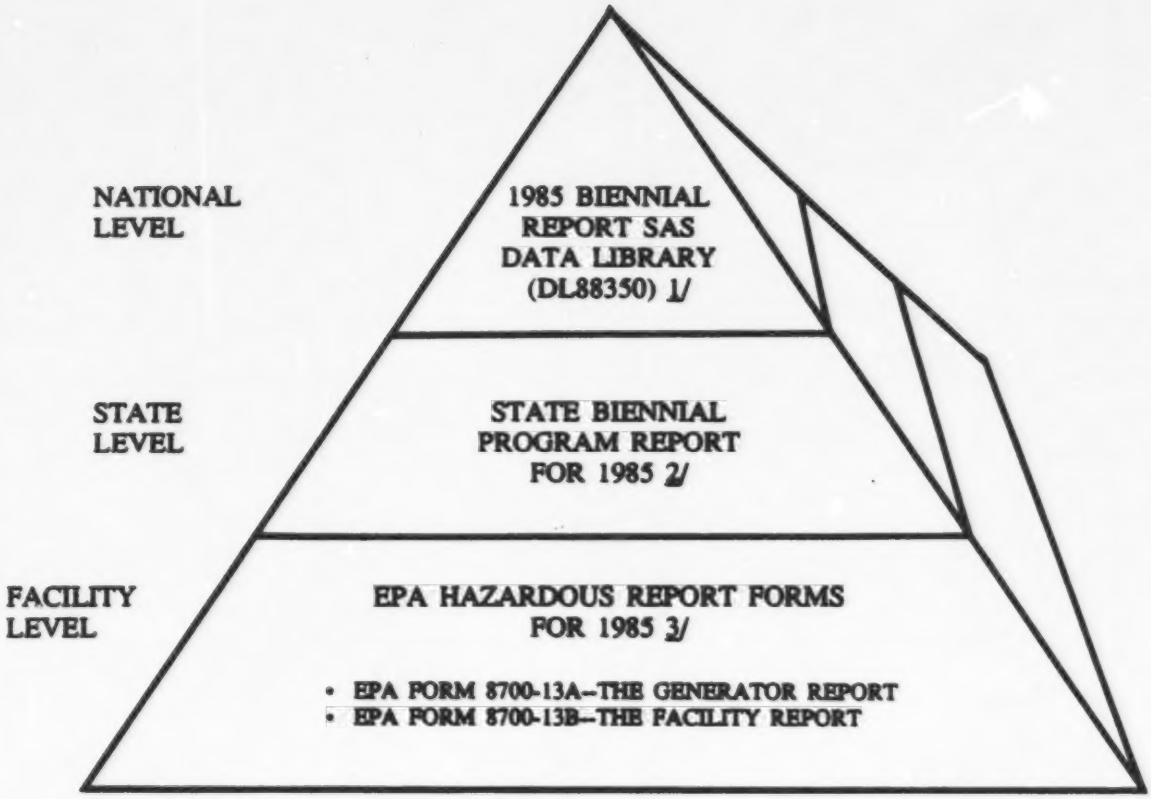
FIGURE 1. U.S. EPA REGIONS AND REGION-STATE DESIGNATIONS

Region-State Designations

4 Alabama	1 Maine	3 Pennsylvania
10 Alaska	3 Maryland	1 Rhode Island
9 Arizona	1 Massachusetts	4 South Carolina
6 Arkansas	5 Michigan	8 South Dakota
9 California	5 Minnesota	4 Tennessee
8 Colorado	4 Mississippi	6 Texas
1 Connecticut	6 Missouri	8 Utah
3 Delaware	8 Montana	1 Vermont
3 District of Columbia	7 Nebraska	3 Virginia
4 Florida	9 Nevada	10 Washington
4 Georgia	1 New Hampshire	3 West Virginia
9 Hawaii	2 New Jersey	5 Wisconsin
10 Idaho	6 New Mexico	8 Wyoming
5 Illinois	2 New York	9 American Samoa
5 Indiana	4 North Carolina	9 Guam
7 Iowa	8 North Dakota	2 Puerto Rico
7 Kansas	5 Ohio	2 Virgin Islands
4 Kentucky	6 Oklahoma	
6 Louisiana	10 Oregon	

Source: U.S. Environmental Protection Agency.

FIGURE 2. SCHEMATIC OF THE 1985 BIENNIAL REPORT DATA SYSTEM



1/ The 1985 Biennial Report SAS Data Library is located on EPA's NCC computer system at Research Triangle Park, NC.

2/ Approximately thirty-five states provided state profile data in the requested format. Others sent computer tapes, state data on computer printouts of facility level forms for EPA Region or DPRA input.

3/ See Appendix B, Volume II for copies of the forms and instructions. Also, some states used approved alternate survey report forms.

Source: Prepared for U.S. Environmental Protection Agency by DPRA.

that constitutes the 1985 Biennial Report SAS (Statistical Analysis System) Data Library. This data library contains all the state and facility level data utilized to produce this two-volume report.

NATIONAL SUMMARY RESULTS

Aggregate information is presented from the individual state and territory summaries based on those RCRA-regulated waste streams and handling methods as defined by EPA in 1985. Table 1 indicates by EPA region the nationally aggregated number of RCRA-regulated large hazardous waste generators and the quantities of their 1985 generated wastes.[1] A total of 21,740 generators reported the generation of 271.0 million tons of hazardous waste in 1985. Figure 3 shows that EPA regions 3, 4, and 6 led in the amount of hazardous waste generated. These regions accounted for 80.7 percent of the national total while regions 1, 7, 8, and 10 were responsible for only a cumulative 1.6 percent.

A much more graphic illustration of the variation in hazardous waste generation in the U.S. by state is presented in Figure 4. The dominant regions - 3, 4, and 6 - in hazardous waste generation are the mid-Atlantic, the Southeastern and the Gulf states.

A further analysis of individual generators throughout the U.S. is also instructive. For instance, the top 50 generators in 1985 accounted for approximately 217 million tons of hazardous waste (federal and state) or 80 percent of the nation's total, and the top 100 generators accounted for 87 percent of the U.S. total. Figure 5 shows the complete, relative profile of the number of generators (in

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[1]Large quantity generators (with 1,000 Kg/month or more) are defined herein as those annually generating hazardous waste quantities of 13.2 tons or more. However, generators without a reported quantity (zero or blank) are also included so that the number of large generators is not underreported from available state data. See Appendix A, Volume II, for detailed state-level generator data by size category.

TABLE 1. NUMBER OF LARGE HAZARDOUS WASTE GENERATORS AND TOTAL HAZARDOUS WASTE QUANTITY GENERATED BY EPA REGION, 1985

Region	Hazardous waste generators		Hazardous waste quantity	
	Number	Percent	Total reported	Percent
		(%)	(000 tons)	(%)
1	2,087	9.6	341	0.1
2	2,247	10.3	25,118	9.3
3	3,433	15.8	69,174	25.5
4	2,227	10.3	95,519	35.2
5	2,916	13.4	12,175	4.5
6	3,040	14.0	54,097	20.0
7	510	2.4	2,057	0.8
8	358	1.7	1,475	0.5
9	4,196	19.3	10,607	3.9
10	726	3.3	475	0.2
TOTAL U.S.	21,740 1/	100.0 *	271,037 2/	100.0 *

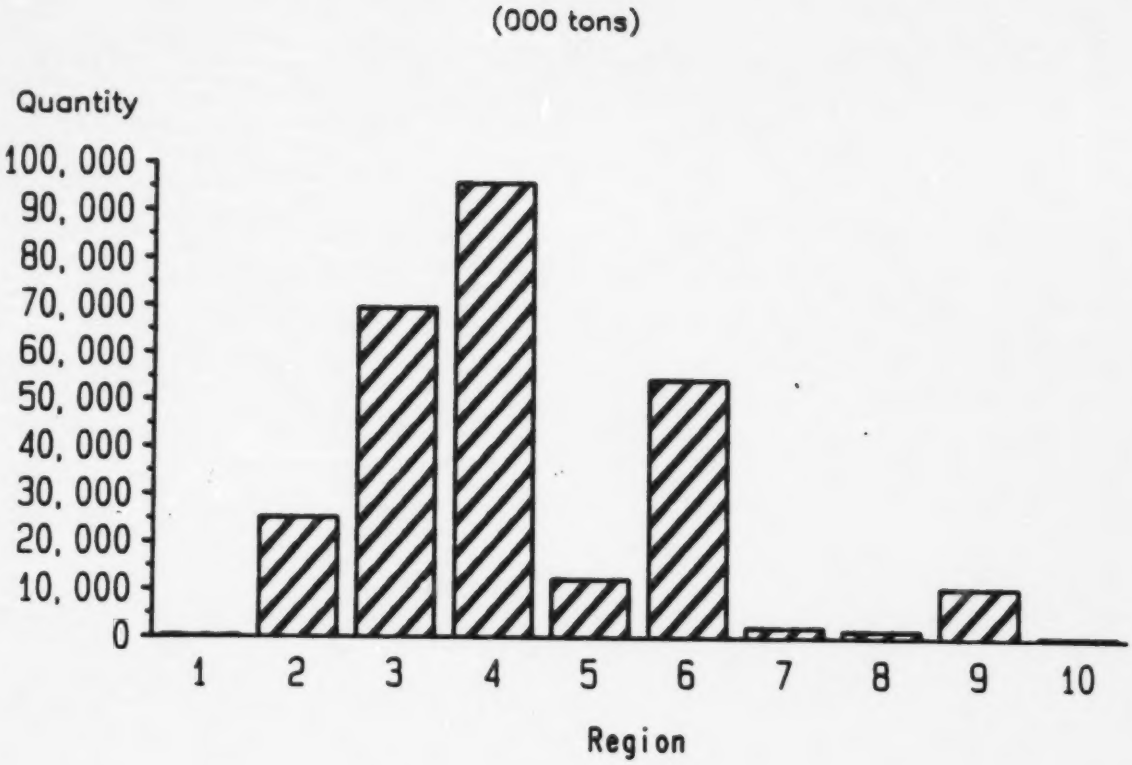
* May not add due to rounding

1/ This number includes all 1985 State Biennial Program Report Section I generators with 13.2 tons or more annually (1,000 kg/month) of hazardous waste and generators with unreported quantities (zero or blank) that may be large generators. See Appendix A, Volume II for generator data comparisons by state. Also, see Appendix C, Volume II, State Biennial Program Report for 1985, for Section I and related definitions.

2/ The total reported hazardous waste quantity is based on the larger of either Section I (RCRA and state-only regulated hazardous waste by generator) or Section III (RCRA-regulated hazardous waste by hazardous waste code) data as reported by each state. This procedure minimizes the effects of missing data errors within either Section I or III. See Appendix A, Volume II for data comparisons by state.

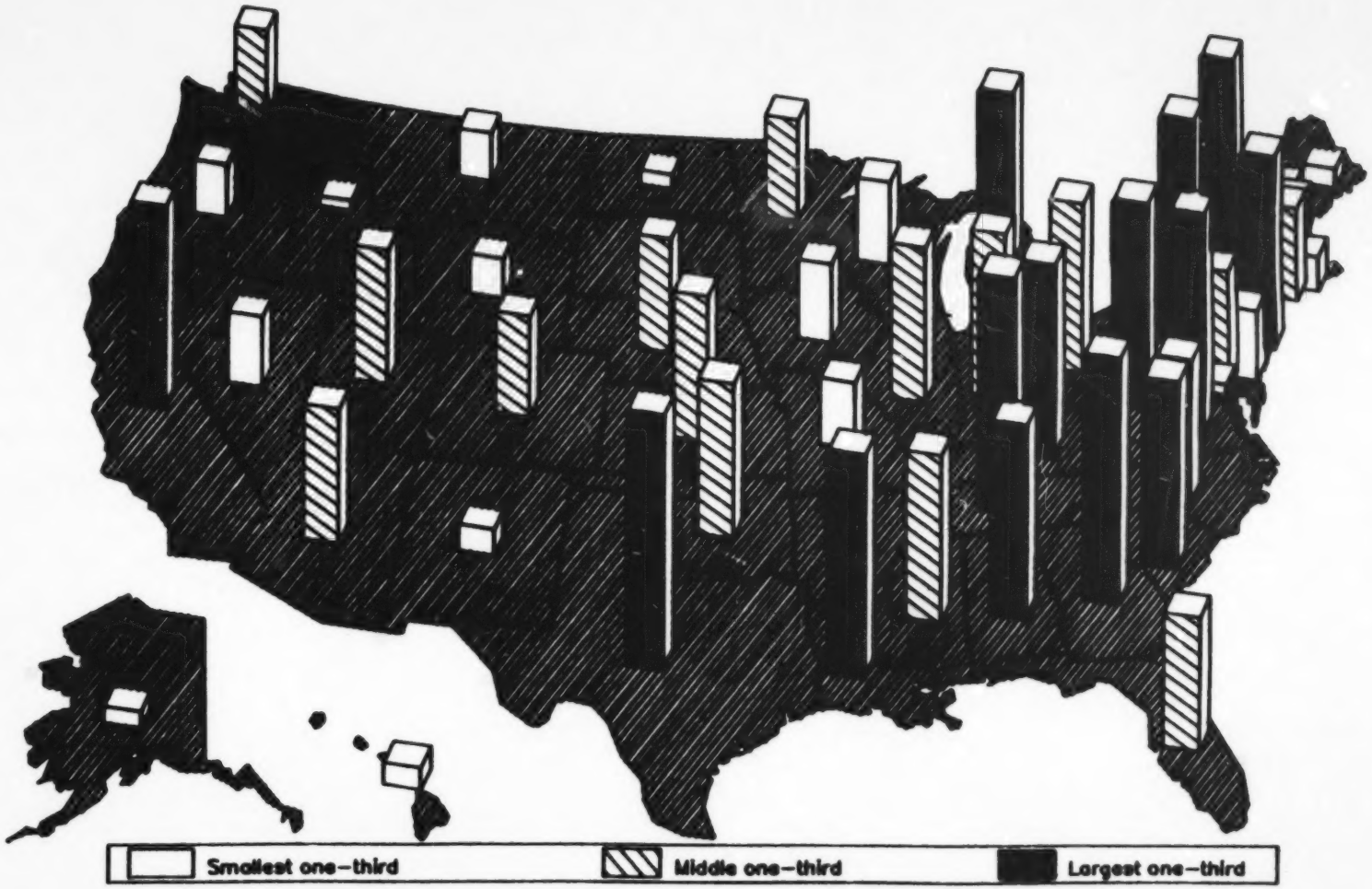
Source: Prepared by DPRA from the 1985 Biennial Report SAS Data Library. (Sections I and III data. DL88350)

FIGURE 3. AMOUNT OF HAZARDOUS WASTE GENERATED BY EPA REGION, 1985



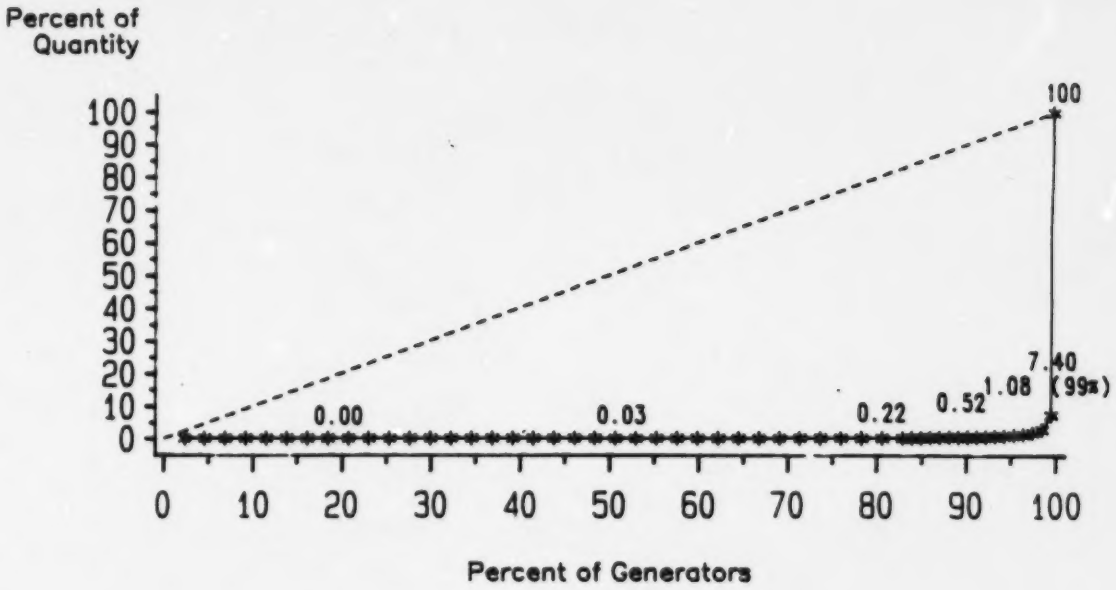
Source: Prepared by DPRA from the 1985 Biennial Report SAS Data Library. (Systems I and III data. DL88350)

FIGURE 4. HAZARDOUS WASTE GENERATED IN THE U.S. BY STATE, 1985



Source: Prepared by DPRA from the 1985 Biennial Report SAS Data Library. (Sections I and III data. DL88350)

FIGURE 5. CUMULATIVE PERCENTAGE OF HAZARDOUS WASTE GENERATED IN THE U.S., 1985 1/



1/ This figure, referred to as a Lorenz curve, is based on 21,740 large quantity generators (LQGs) with 271.0 million tons of hazardous waste in 1985.

Source: Prepared by DPRA from the 1985 Biennial Report SAS Data Library. (Section IIIb data. DL88350)

order by size) and the corresponding amount of hazardous waste generated. This clearly illustrates the marked dominance of the major generators. Fewer than five percent of the generators account for over 95 percent of the national generated hazardous waste.[2]

The aggregated national total indicates that 4,944 RCRA-regulated TSD facilities existed in 1985. As Table 2 shows, the greatest number of facilities were in EPA regions 6, 5, and 3 respectively. Regions 10, 8, and 7, respectively, had the fewest.

The reported national total of RCRA-regulated hazardous waste handled by all reporting TSD facilities in calendar year 1985 was 237.9 million tons. As Table 2 also shows, the greatest quantities of hazardous waste were handled in regions 3, 4, and 6 which managed 28.9, 26.9, and 24.8 percent respectively or 80.6 percent of the total. The relative relationships of hazardous waste managed among the regions are further depicted in Figure 6. Regions 1, 7, and 10 managed less than 2.0 percent collectively. A more graphic illustration of hazardous waste management in the U.S. is presented in Figure 7. This figure shows the proportional amounts of hazardous waste managed by state and highlights the concentrations of managed hazardous wastes in the eastern and Gulf states, a pattern roughly corresponding to that of the primary areas of hazardous waste generation.

A total of 2,801 facilities or 56.7 percent of the facilities operating in 1985 used container storage as a handling method; 1,089 facilities or 22.0 percent used storage in tanks. Only 16 facilities reported using ocean disposal - most of

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[2]Figure 5 accounts for only the large quantity generators where LQGs are those with more than 1,000 Kg/month (or 13.2 ton per year). There are 21,740 LQGs in the 1985 Biennial Report SAS Data Library. See Volume II, Appendix A, for further details concerning large (and small) generators and their hazardous waste quantities.

TABLE 2. NUMBER OF HAZARDOUS WASTE TREATMENT, STORAGE AND DISPOSAL (TSD) FACILITIES AND QUANTITY OF HAZARDOUS WASTE MANAGED BY EPA REGION, 1985

Region	TSD facilities		Quantity of hazardous waste managed	
	Number	Percent	Quantity	Percent
		(%)	(000 tons)	(%)
1	236	4.8	787	0.3
2	470	9.5	19,335	8.1
3	630	12.8	68,824	28.9
4	531	10.7	63,954	26.9
5	916	18.5	13,818	5.8
6	1,317	26.6	59,030	24.8
7	185	3.7	1,459	0.6
8	102	2.1	5,233	2.2
9	468	9.5	4,758	2.0
10	89	1.8	677	0.3
TOTAL U.S.	4,944 1/	100.0 *	237,875 2/	100.0 *

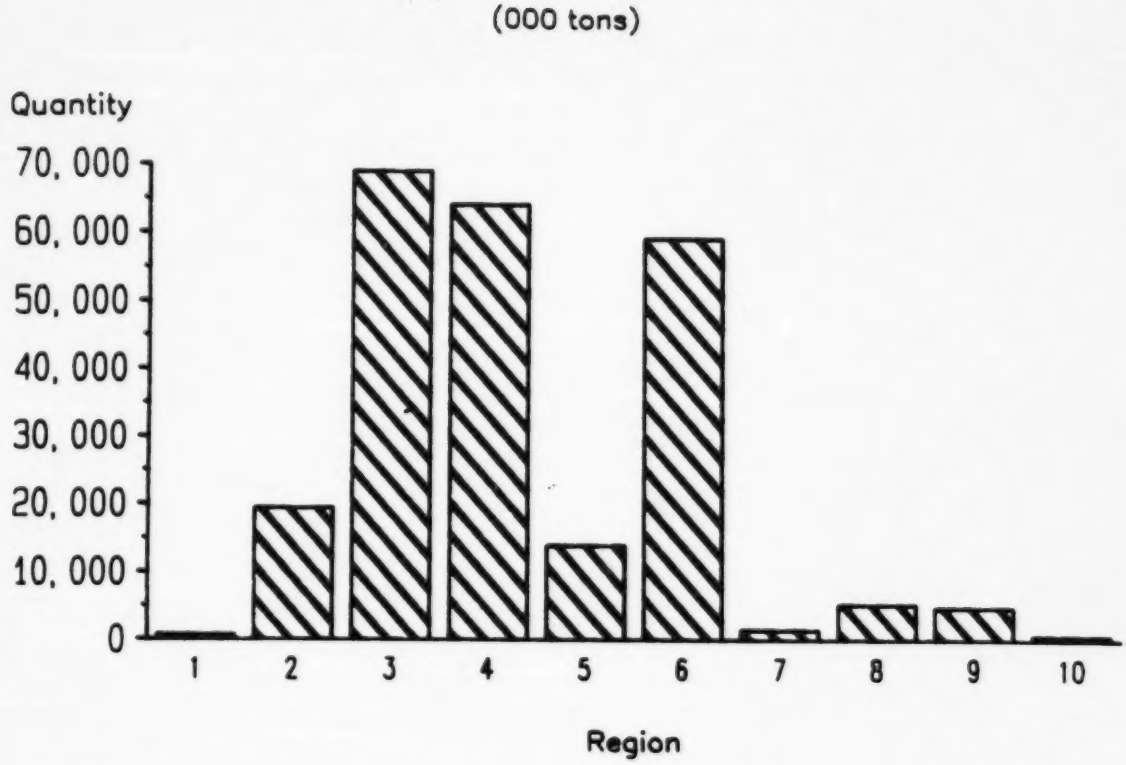
* May not add due to rounding.

1/ The number of TSD facilities is based on the 1985 State Biennial Program Report Section II data that lists each reported facility. See Appendix C, Volume II, State Biennial Program Report for 1985, for Section II and related definitions.

2/ The total quantity of hazardous waste managed is based on the larger of either Section II (RCRA and state-only regulated hazardous waste by facility) or Section VI (RCRA-regulated hazardous waste by hazardous waste code) data as reported by each state. This procedure minimizes the effects of missing data errors within either Section II or VI. See Appendix A, Volume II for data comparisons by state.

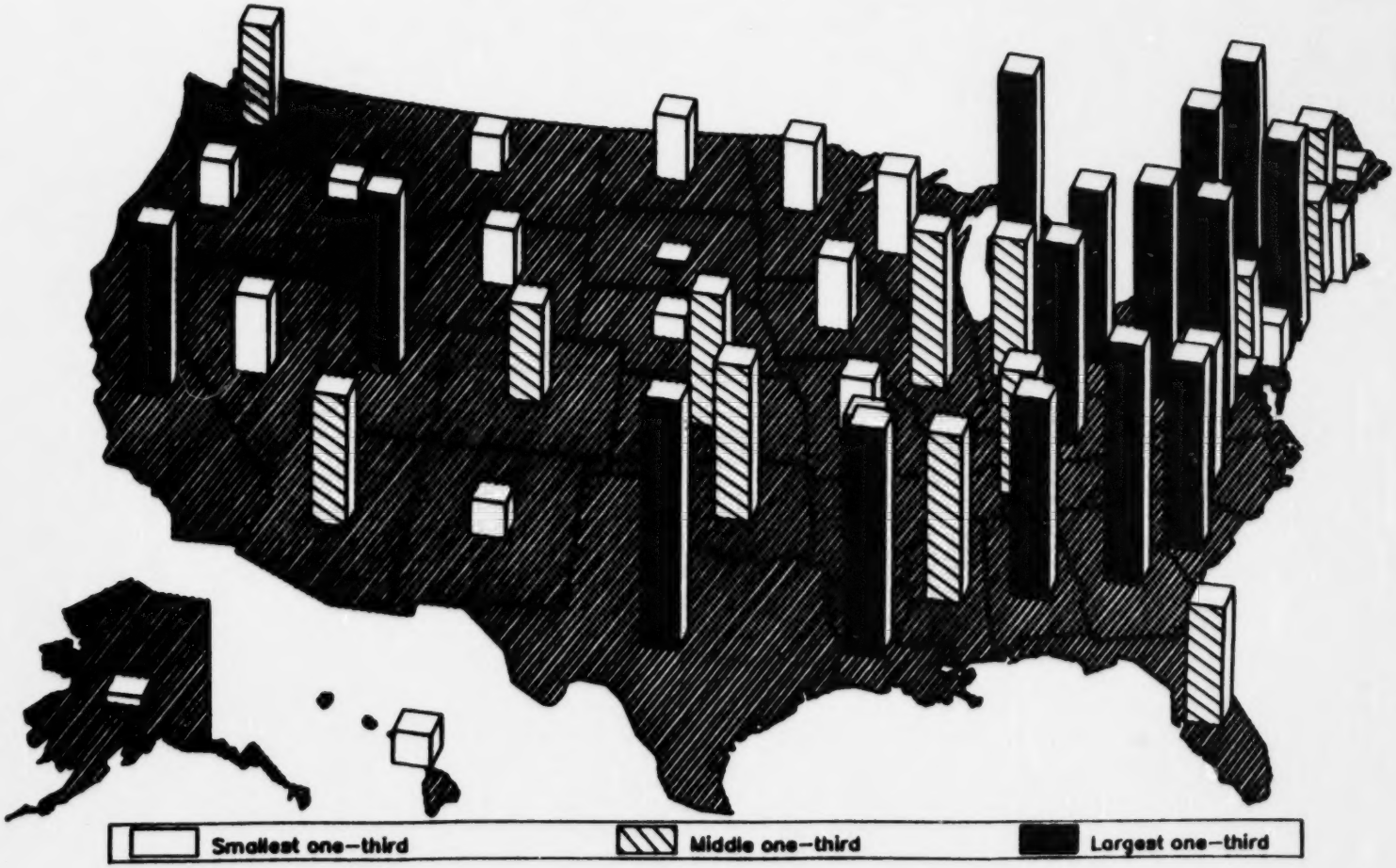
Source: Prepared by DPRA from the 1985 Biennial Report SAS Data Library. (Sections II and VI data. DL88350)

FIGURE 6. AMOUNT OF HAZARDOUS WASTE MANAGED BY EPA REGION, 1985



Source: Prepared by DPRA from the 1985 Biennial Report SAS Data Library. (Sections II and VI data. DL88350)

FIGURE 7. HAZARDOUS WASTE MANAGED IN THE U.S. BY STATE, 1985



Source: Prepared by DPRA from the 1985 Biennial Report SAS Data Library. (Section II and VI data. DL88350)

these were located in Region 6 (Texas and Louisiana). Region 6, which had a total of 1,317 TSD facilities in 1985, reported that 896 or 68.0 percent used container storage.

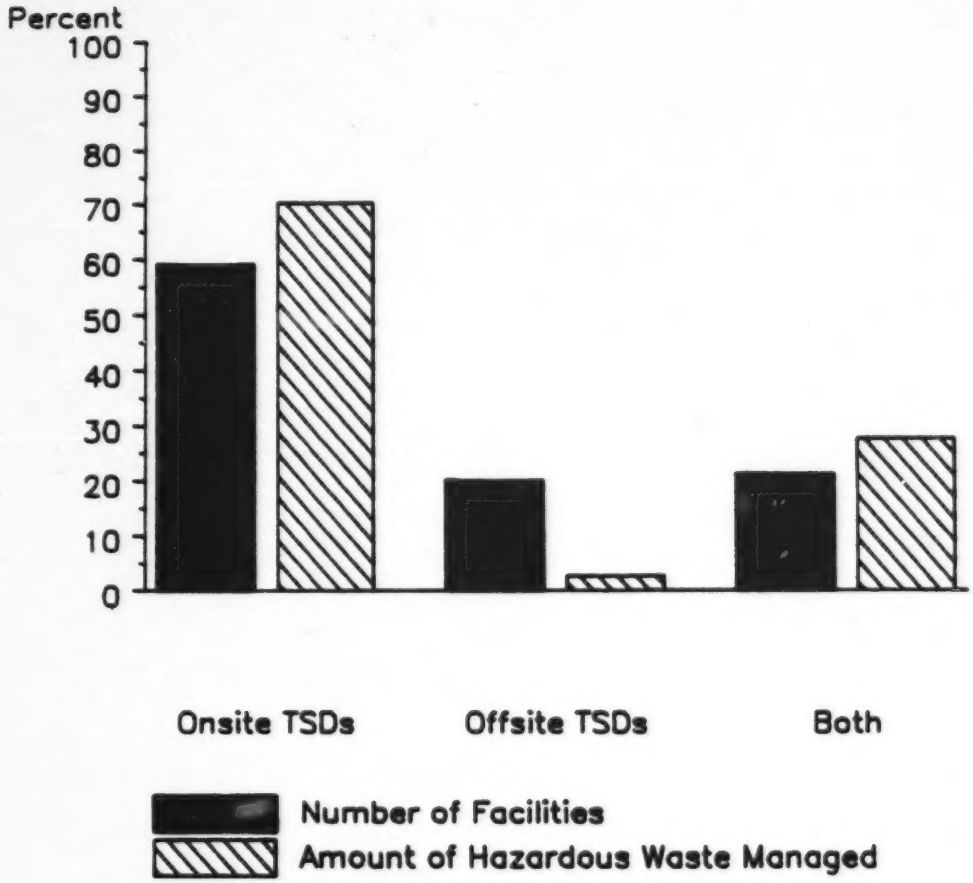
Of the total number of TSD facilities reporting in 1985, 59.1 percent managed only onsite generated waste, and these accounted for 70.1 percent of the 1985 totals. By comparison 20.0 percent of all facilities claimed to manage only offsite generated hazardous waste or but 2.6 percent of the total. Finally, 20.9 percent of the total number of reporting TSD facilities managed both onsite and offsite generated wastes, accounting for 27.3 percent of the 1985 reported hazardous waste. Figure 8 illustrates these relationships between onsite and offsite managed wastes or both.

Five major hazardous waste streams accounted for 86.0 percent of the total waste reported by the states as having been generated in 1985. These five leading wastes and the percentage of the national total each represents are as follows:

RCRA Waste Code[3]	Hazardous Waste Description	Percent of Total
D002	Corrosive waste	42.1
MOMX	Mixtures, general (including some state-only regulated waste)	31.9
DOMX	Mixtures, characteristic	6.2
D007	Chromium waste	3.3
KOMX	Mixtures, listed industrial	2.5

[3]RCRA waste codes are defined in 40 CFR 261. By category, the types of wastes included as RCRA wastes are the following: D001-D017 = characteristic hazardous waste (HW); F001-F028 = HW from nonspecific sources; K001-K136 = HW from specific sources, P001-P123 = discarded commercial chemical products, off-specification species, container residuals, and spill residues thereof - acute HW; U001-U359 = discarded commercial chemical products, off-specification species, container residues, and spill residues thereof - toxic waste. MX (and M) refer to mixtures that were not specifically classified, per se, in the 1985 Biennial Hazardous Waste Report form, including state-only regulated wastes where applicable.

FIGURE 8. RELATIVE AMOUNT OF HAZARDOUS WASTE MANAGED IN ONSITE AND OFFSITE FACILITIES, 1985



Source: Prepared by DPRA from the 1985 Biennial Report SAS Data Library. (Section IIa data. DL88350)

Figure 9 is a schematic chart that shows the relative importance of these major hazardous wastes.

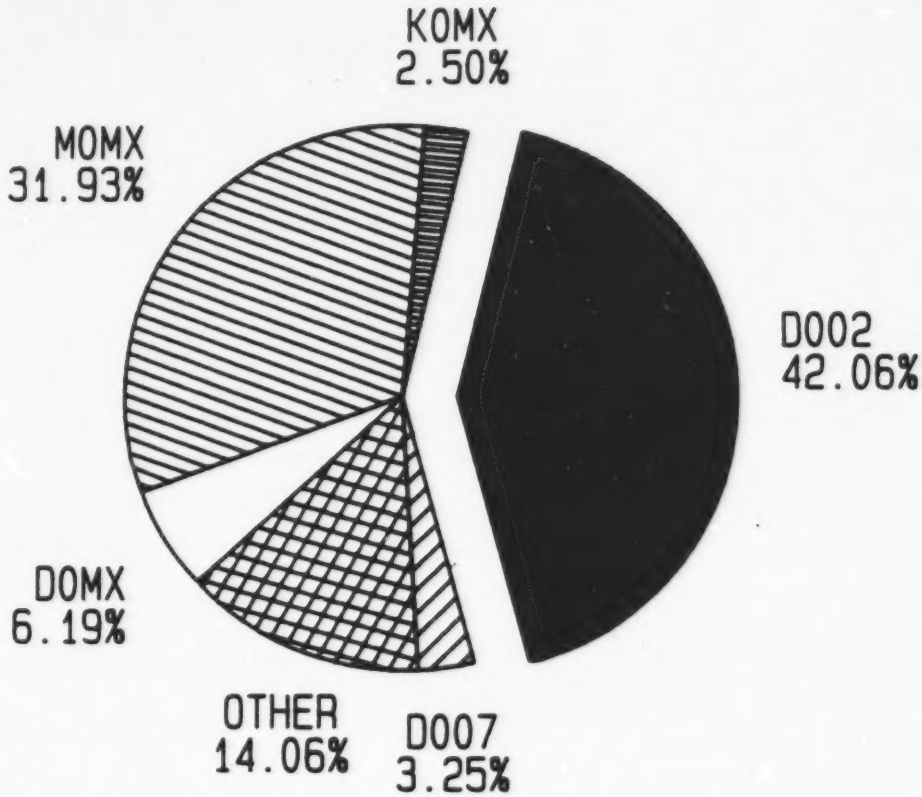
A total of 3.1 million tons of hazardous waste was shipped by generators to out-of-state TSD facilities. The five leading exporting states of hazardous waste were New Jersey, Ohio, Pennsylvania, Texas, and Massachusetts, states which accounted for 38.1 percent of all interstate shipments in 1985. The five leading importing states to which hazardous wastes were shipped in 1985 were Pennsylvania, Louisiana, Ohio, Michigan, and New York, with a combined 49.5 percent of the waste as determined by data reported by the exporting states.

EPA required that each state report by specified handling code the total quantities of the RCRA-regulated wastes which were treated, stored, or disposed of within the state during 1985. The main handling methods utilized nationally in 1985 were, in volume rank order, treatment in tanks (Biennial Report code T01), other treatment (T04), injection well disposal (D79), and treatment in surface impoundments (T02). These four methods accounted for approximately 91 percent of the hazardous waste managed by one or more management methods.

A simulation model was concurrently developed to depict typical management of particular waste streams after their arrival at a TSD facility and prior to their ultimate disposal. That model (see: "Network Simulation Model of Hazardous Waste Management in the U.S.," EPA/OSW, January 1988) offers a more detailed and accurate reflection of the total quantities disposed of by each handling method.

The quantities of hazardous waste managed by each handling method are further subdivided into quantities managed by waste group and into onsite and offsite categories. Overall, less than 5 percent (4.5%) of all hazardous waste managed was handled offsite. The U, D001 and F006-F024 waste streams, i.e., U =

FIGURE 9. LEADING HAZARDOUS WASTES IN THE U.S.
BY EPA WASTE CODE, 1985



D002 Corrosive waste
MOMX Mixture, general
DOMX Mixture, characteristic
D007 Chromium waste
KOMX Mixtures, listed industrial

Source: Prepared by DPRA from the 1985 Biennial Report SAS Data Library. (Section IIIb data. DL88350)

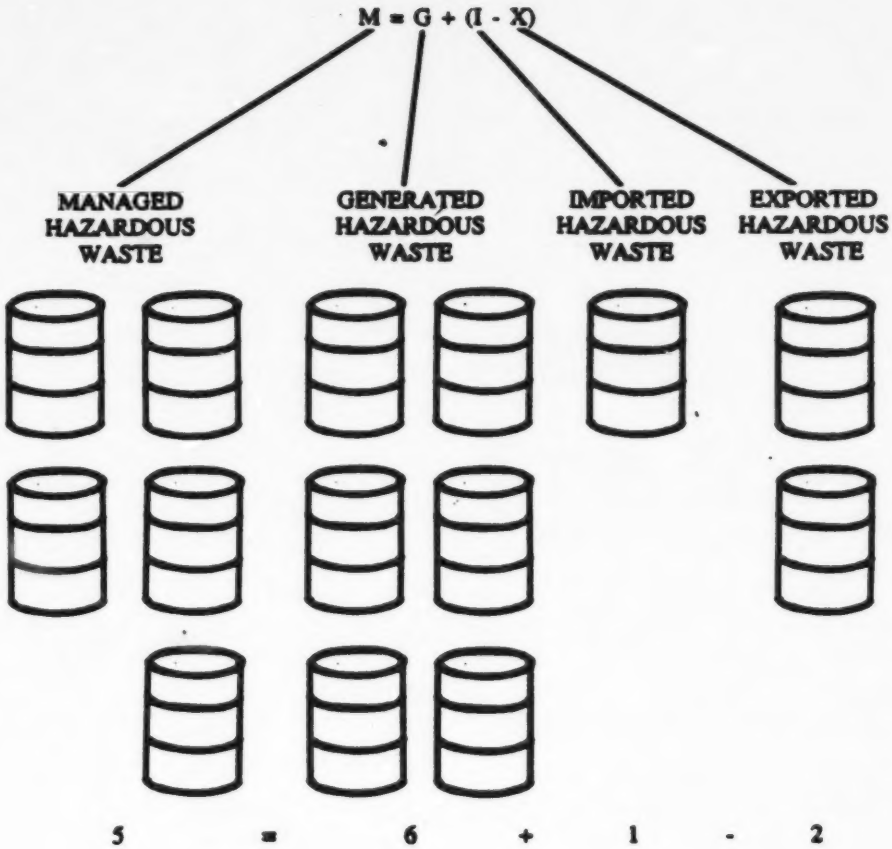
toxic wastes, D001 = Ignitable waste, and F006-F024 = non-specific sources, were managed offsite relatively more often than the other waste categories.

The only previous study containing extensive national data on hazardous waste management was a 1981 Mail Survey. (A more comprehensive 1983 study was not released because of data problems.) The available estimates for 1981 and 1985 are not directly comparable because of different reporting methodologies used, but the present study did attempt a relatively complete, though necessarily limited, comparative analysis was done to the extent possible.

Throughout the 1985 Biennial Report data gathering and management process, a series of quality assurance and quality control (QA/QC) procedures were followed to assure that the data reported were internally consistent and reasonable as reported. Wherever data discrepancies occurred, efforts were made to reconcile the problem either from existing reports or by contacting state officials who were responsible for their state's 1985 Biennial Report. Not all states were able to respond to detailed requests for additional data (primarily because of resource constraints); consequently, there are missing data for identifiable site-specific variables in the overall data base and aggregate results, therefore, tended to be underreported. It is generally expected, however, that the states consistently included the largest generators and TSD facilities in their 1985 Biennial Report submissions. Hence, aggregate findings are expected to be relatively complete, i.e., omission of the smaller facilities' data has a limited relative effect on the aggregate results.

Another quality assurance procedure developed in this study was to seek state and national "mass balance" estimates of hazardous waste generation and management. This procedure employed the following mass balance principle: hazardous waste managed (M) equals hazardous waste generated (G) plus imports (I) minus exports (X). Figure 10 depicts this mass balance concept as the equation:

FIGURE 10. ILLUSTRATION OF THE MASS BALANCE CONCEPT FOR HAZARDOUS WASTE



Source: Prepared for U.S. Environmental Protection Agency by DPRA.

$$M = G + (I - X)$$

The 1985 Biennial Report Statistical Analysis System (SAS) Data Library contains estimates of these mass balance variables for each state (see Chapter IV State and Territory Summary Profiles) that can also be aggregated for the nation. The present reports' QA/QC objectives required contacting the states with either large relative or absolute differences in their reported mass balance estimates. Overall, 25 states were examined and, where applicable, hazardous waste quantities generated and managed were recalculated. In the aggregate, approximately 215 million tons of hazardous waste were reported both generated and managed.[4] The main type of proposed revision (desirable for obtaining uniform data reporting) involved in this assessment is to exclude wastewater from the quantities generated after being treated in exempt processes. Such exemptions would effectively reduce the reportable quantity of hazardous waste generated.

While this quality assurance procedure was effective in accounting for the major differences between TSD-managed and adjusted generation quantities, not all proposed changes were deemed acceptable in the 1985 Biennial Report SAS Data Library pending formal reporting from state officials. For example, until states officially exclude wastewater managed in exempt units from their generation and TSD quantities (a procedure which would achieve more uniform reporting), this change is being withheld. However, specific and documented state data changes were made for several states, e.g., New Jersey, Illinois, Maryland, and Oregon, following this QA/QC procedure.

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[4]It is emphasized that this QA/QC procedure was completed using a draft version of the SAS Data Library, i.e., September 15, 1987. Additional quantities of hazardous waste generated and managed were reported subsequent to the procedure.

Although numerous steps were taken to improve data quality and consistency among the states' hazardous waste generation and management data, users of the 1985 Biennial Report data must be cognizant that the data should be carefully interpreted. Data discrepancies will continue to exist because not all facility and state reporting practices are uniform. Variations in reporting exist by generator size (differing state small quantity generator definitions), by waste code (differing state-only regulated wastes or unique state waste coding systems), and by other factors (e.g., differing state procedures for including or excluding storage-transfer only stations). Such variations cannot be fully addressed retroactively, although EPA continues its efforts to improve future data gathering procedures. Also, the 1985 Biennial Report gathered export data from each state, including the expected state destinations for exported wastes, and these reported destinations (and associated quantities) represent derived "imports" for the states. However, no corresponding import data by each importing state were collected. It appears that discrepancies would be found in the quantities reported by these two methods, and future surveys should include imports reported by each receiving state as well as the exports reported by each sending state. Figure 11 briefly describes these overall data concerns.

STATE AND TERRITORY SUMMARY PROFILES

State-by-state comparisons of summary data are accomplished by first ranking the states in order based on the quantity of RCRA-regulated hazardous waste generated (Table 3) with a reporting of the corresponding number of RCRA regulated generators in 1985. Secondly, a rank ordering of states is done based on the quantity of RCRA-regulated hazardous waste managed (Table 4) with the reporting of the corresponding number of regulated TSD facilities in 1985. Overall, there is a high correlation in the ranking of states by generation and management, largely because most industrial wastes are managed by onsite TSD facilities. Thus, most states manage approximately the same quantities as they

FIGURE 11. OVERVIEW OF DATA CONCERNS WITH THE 1985 BIENNIAL REPORT

GENERATOR HAZARDOUS WASTE AMOUNTS

- Amounts by generator (Section I) differ in some states from amounts by EPA waste code (Section III). Facility data, waste code data, or both may be missing.
- Wastewater content of reported waste amounts varies among generators and states.
  - The percent solids content of wastestreams varies among industrial processes.
  - Wastewater is reported by some states but excluded by others when it is treated in exempt units and discharged to POTWs or managed under NPDES permits.
- Long term storage of hazardous waste may result in carryover amounts into subsequent periods.
- One time or irregular wastestreams, e.g., clean-up, may abnormally affect generation amounts.

TSD FACILITY AMOUNTS

- Amounts by TSD facility (Section II) may differ from amounts by handling method and waste code (Section VI). Facility data, handling method-waste code data, or both appear to be missing or misreported. Biennial report instructions for intermediate handling methods for 1985 were unclear.
- Intermediate treatment and storage methods employed sequentially and reported appear to result in multiple counting although volumes are reduced following some treatment methods.

EXPORTS/IMPORTS OF HAZARDOUS WASTES

- Only exports are reported (amounts by state of destination). Imports are derived as reported by exporting states. No internal verification of imports is possible.
- RCRA-regulated and state-only hazardous waste amounts exported are combined in the state reports and are not separable as reported.
- Tracking of exports appears limited, and delivered 1985 export amounts were generally unverifiable.

STATE-ONLY REGULATED WASTES

- State-only regulated wastes vary among the states from none to many.
- Mixtures of RCRA-regulated and state-only hazardous wastes are jointly reported by some states, e.g., MOMX, and amounts of each are not separable.

OTHER DATA CONCERNS

- Units of measurement vary and conversions from volume to mass were required e.g., 8.34 pounds per gallon was used if density factors were not otherwise available.
- Degrees of hazardousness of wastes to human health and the environment are not reported before or after treatment. Some small quantity generators may produce more harmful wastestreams than some large quantity generators.
- Handling methods by waste code were inconsistently reported with multiple counting of wastes occurring in some facility and state reports. Both original waste amounts and amounts by handling method are desirable.
- Ongoing RCRA regulatory and hazardous waste listing changes result in shifts in data needs and priorities. However, data collection for 1985 beyond the 1985 Biennial Report data system as summarized was outside the study's scope.

TABLE 3. RANK ORDERING OF STATES BASED ON THE QUANTITY OF RCRA-REGULATED HAZARDOUS WASTE GENERATED AND THE CORRESPONDING NUMBER OF RCRA AND STATE-REGULATED GENERATORS IN 1985

Rank	State	1985 RCRA-regulated hazardous waste 1/		RCRA and State-regulated generators 2/	
		Quantity	Percent	Number	Percent
		(000 tons)			
1	Texas	38,767.6	14.30	2,450	11.28
2	Georgia	37,324.8	13.77	330	1.52
3	Tennessee	33,199.0	12.25	556	2.56
4	Pennsylvania	31,307.2	11.55	2,607	12.00
5	Virginia	24,995.5	9.22	532	2.45
6	New York	15,969.2	5.89	652	3.00
7	Louisiana	13,672.1	5.04	302	1.39
8	West Virginia	12,077.1	4.46	57	0.26
9	California	9,657.8	3.56	3,972	18.28
10	New Jersey	8,999.5	3.32	1,480	6.81
11	Kentucky	7,661.9	2.83	187	0.86
12	Alabama	7,406.2	2.73	217	1.00
13	South Carolina	5,300.8	1.96	171	0.79
14	Michigan	4,076.9	1.50	542	2.49
15	Ohio	2,986.3	1.10	688	3.17
16	Indiana	2,517.9	0.93	395	1.82
17	Mississippi	2,507.5	0.93	109	0.50
18	Illinois	2,141.4	0.79	760	3.50
19	Oklahoma	1,591.2	0.59	118	0.54
20	Kansas	1,324.7	0.49	131	0.60
21	North Carolina	1,285.3	0.47	384	1.77
22	Utah	1,134.8	0.42	220	1.01
23	Arizona	846.7	0.31	160	0.74
24	Florida	833.7	0.31	273	1.26
25	Maryland	698.3	0.26	206	0.95
26	Nebraska	543.4	0.20	65	0.30
27	Washington	439.2	0.16	188	0.87
28	Minnesota	328.6	0.12	291	1.34
29	Colorado	295.0	0.11	90	0.41
30	Connecticut	178.0	0.07	364	1.68
31	Puerto Rico	149.0	0.05	115	0.53
32	Wisconsin	123.4	0.05	240	1.10
33	Iowa	120.8	0.04	123	0.57
34	Massachusetts	114.4	0.04	1,013	4.66
35	Nevada	94.8	0.03	34	0.16
36	Delaware	94.5	0.03	25	0.12
37	Missouri	68.1	0.03	191	0.88
38	Arkansas	57.2	0.02	114	0.52
39	Oregon	30.8	0.01	505	2.32
40	Montana	25.2	0.01	17	0.08
41	New Hampshire	19.9	0.01	102	0.47
42	Wyoming	15.8	0.01	14	0.06
43	Rhode Island	11.6	0.00	403	1.85
44	Vermont	9.8	0.00	124	0.57
45	New Mexico	8.8	0.00	56	0.26
46	Hawaii	7.3	0.00	26	0.12
47	Maine	7.1	0.00	69	0.32
48	North Dakota	3.2	0.00	8	0.04
49	Alaska	2.6	0.00	9	0.04
50	Idaho	2.0	0.00	24	0.11
51	District of Columbia	1.9	0.00	6	0.03
52	South Dakota	0.9	0.00	9	0.04
53	Guam	0.4	0.00	4	0.02
	TOTAL*	271,037.3	100.00	21,728	100.00

* May not add due to rounding. 0.00 indicates less than 0.01 percent.

1/ Some states exempt hazardous wastewater following treatment from further regulation (if non-hazardous) while other states do not exempt such wastewater. Consequently, the rank ordering of states could vary if the exemption procedure were constant.

2/ Number of large quantity generators, i.e., over 13.2 tons annually, plus generators with unreported quantities (zeros or blanks). See Appendix A.

Source: Prepared by DPRA from the 1985 Biennial Report SAS Data Library. (Survey Sections I and III data. DL88350)

TABLE 4. RANK ORDERING OF STATES BASED ON THE QUANTITY OF RCRA-REGULATED HAZARDOUS WASTE MANAGED AND THE CORRESPONDING NUMBER OF RCRA AND STATE-REGULATED TSD FACILITIES IN 1985

Rank	State	1985 RCRA-regulated hazardous waste 1/		RCRA and State-regulated TSD facilities	
		Quantity	Percent	Number	Percent
		(000 tons)			
1	Texas	41,426.2	17.42	1,153	23.32
2	Georgia	37,318.5	15.69	91	1.84
3	Pennsylvania	31,179.3	14.11	464	9.39
4	Virginia	24,970.7	10.50	67	1.36
5	Louisiana	14,699.8	6.18	67	1.36
6	West Virginia	12,044.9	5.06	39	0.79
7	New York	10,219.6	4.30	132	2.67
8	New Jersey	8,985.9	3.78	284	5.75
9	Kentucky	8,245.8	3.47	44	0.89
10	Alabama	7,593.0	3.19	66	1.33
11	Michigan	5,536.7	2.33	126	2.55
12	South Carolina	5,292.7	2.22	83	1.68
13	Utah	4,777.7	2.01	39	0.79
14	Ohio	3,851.8	1.62	251	5.08
15	California	3,734.3	1.57	348	7.04
16	Mississippi	2,449.3	1.03	47	0.95
17	Illinois	2,355.6	0.99	295	5.97
18	Oklahoma	2,171.9	0.91	46	0.93
19	Indiana	1,873.4	0.79	133	2.69
20	North Carolina	1,416.3	0.60	78	1.58
21	Kansas	1,324.6	0.56	35	0.71
22	Arizona	920.0	0.39	98	1.98
23	Tennessee	915.5	0.38	50	1.01
24	Arkansas	724.3	0.30	35	0.71
25	Florida	723.3	0.30	72	1.46
26	Washington	642.9	0.27	60	1.21
27	Maryland	601.9	0.25	44	0.89
28	Massachusetts	541.8	0.23	52	1.05
29	Colorado	279.9	0.12	34	0.69
30	Connecticut	174.2	0.07	138	2.79
31	Puerto Rico	129.7	0.05	54	1.09
32	Wisconsin	105.4	0.04	70	1.42
33	Nevada	96.9	0.04	8	0.16
34	Iowa	94.9	0.04	46	0.93
35	Minnesota	94.9	0.04	41	0.83
36	North Dakota	84.7	0.04	7	0.14
37	Rhode Island	67.4	0.03	13	0.26
38	Wyoming	66.0	0.03	11	0.22
39	Missouri	34.1	0.01	96	1.94
40	Oregon	28.6	0.01	13	0.26
41	Delaware	27.3	0.01	15	0.30
42	Montana	24.8	0.01	9	0.18
43	New Mexico	7.4	0.00	16	0.32
44	Hawaii	6.2	0.00	12	0.24
45	Nebraska	5.0	0.00	8	0.16
46	Idaho	4.3	0.00	11	0.22
47	Maine	2.6	0.00	17	0.34
48	Alaska	1.3	0.00	5	0.10
49	Vermont	0.8	0.00	7	0.14
50	New Hampshire	0.7	0.00	9	0.18
51	Guam	0.3	0.00	2	0.04
52	South Dakota	0.0	0.00	2	0.04
53	District of Columbia	0.0	0.00	1	0.02
	TOTAL *	237,875.3	100.00	4,944	100.00

* May not add due to rounding. 0.0 indicates less than 100 tons; 0.00 indicates less than 0.01 percent.

1/ Some states exempt hazardous wastewater following treatment from further regulation (if non-hazardous), e.g., Tennessee, while other states do not exempt such wastewater. Consequently, the rank ordering of states could vary if the exemption procedure were constant.

Source: Prepared by DPRA from the 1985 Biennial Report SAS Data Library. (Survey Sections II and VI data. DL88350)

generate. Texas, Georgia, Pennsylvania and Virginia[5] rank among the top five states in both quantities generated and quantities managed.[6]

A state profile, consisting of a three-page summary, is presented in Volume II of this report for all states and territories. Figure 12 illustrates this profile's content. Page one of the profile contains summary data regarding generators, TSD facilities and handling methods. Page two shows each state's reported shipments of exported hazardous waste, including quantities shipped by destination. In addition, page two reports hazardous waste shipments to each state ("imports") as reported by the exporting states. (Imports received are unconfirmed by the receiving states, however.) Finally, page three shows the amount of each of the nation's 50 most prevalent hazardous wastes generated within the state and the rank of the waste in the state's total waste volume.

APPENDICES

Three appendices are included in the Volume II report. Appendix A summarizes key generator and TSD facility data on a state-by-state basis with data comparisons within each state and nationally. Copies of the U.S. EPA Hazardous Waste Biennial Report forms for 1985 are shown in Appendix B and a copy of the State Biennial Program Report forms for 1985 comprise Appendix C. The U.S. EPA Report forms (or approved alternate forms) were designed for individual generators and TSD facilities and were to be submitted either to the states or EPA regional offices. The data on these forms were summarized on

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[5]Virginia emphasizes that wastewater is included in its generation and management data and its ranking is accordingly affected. No precise procedure for consistently removing wastewater from state-reported data was found; each state's data are in the form reported.

[6]Tennessee ranks high as a generator of hazardous waste including large quantities of wastewater that are ultimately treated in RCRA-exempt processes and properly disposed. Consequently, the quantity of managed hazardous waste in the state is significantly lower following the exclusion of exempt-process wastes.

FIGURE 12. ILLUSTRATION OF 1985 BIENNIAL REPORT STATE PROFILE TABLES

1985 BIENNIAL REPORT STATE PROFILE FOR THE STATE OF WASHINGTON
(TABLE 3 OF 3)
WASTE STREAM GENERATION STATE RANKING COMPARED TO NATIONAL RANKING (TOP FIFTY)

NATIONAL RANK	WASTE CODE	QUANTITY GENERATED IN STATE (TONS)	STATE WASTE CODE RANK	PERCENT OF STATE TOTAL
1	D002	67,401	3	19.91
2	D008	81,882	2	24.17
3	D006	148,529	1	43.88
4	D007	420	16	0.12
5	D004	1,398	11	0.41
6	F003	303	18	0.08
7	D003	134	22	0.03
				0.75
				1.29
				4.27
				1.87
				0.44
				0.26
				N/A
				N/A
				N/A
				N/A
				0.00
				0.13
				N/A
				0.00
				N/A
				0.04
				0.00
				0.19
				0.13
				0.02
				0.00
				0.00
				0.05
				0.09
				N/A
				0.01
				0.05
				0.02
				N/A
				N/A
				0.00
				N/A
				0.00
				N/A
				0.00
				N/A
				N/A
				0.00
				N/A
				N/A

0 DATA. DL00350)

1985 BIENNIAL REPORT STATE PROFILE FOR THE STATE OF WASHINGTON
(TABLE 2 OF 3)

TOTAL QUANTITY OF HAZARDOUS WASTE REPORTED SHIPPED OUT OF STATE (EXPORTS)

RECEIVING STATE	TONS SHIPPED
ARKANSAS	46
ARIZONA	64
CALIFORNIA	4,251
COLORADO	1

TOTAL QUANTITY OF HAZARDOUS WASTE REPORTED SHIPPED FROM OTHER STATES (IMPORTS) 1/

STATES SHIPPING TO WASHINGTON	TONS SHIPPED
ALASKA	32
CALIFORNIA	769
COLORADO	2
HAWAII	3
	443
	31
	9,906
	1
	0
	1,917
	8,712

DATA. DL00350)

NG STATES. TONS SHIPPED
QUANTITIES RECEIVED BY

1985 BIENNIAL REPORT STATE PROFILE FOR THE STATE OF WASHINGTON
(TABLE 1 OF 3)

TOTAL NUMBER OF RCRA REGULATED LARGE GENERATORS (SECTION IA) 1/ 100

TOTAL QUANTITY (TONS) OF REGULATED WASTE GENERATED (SEC. IA/IIIB) 2/ 439,217

RCRA REGULATED TSD FACILITIES (SECTION II)	NUMBER	PERCENT OF WASTE
FACILITIES MANAGING ONLY ONSITE GENERATED WASTE:	38	72.19 %
FACILITIES MANAGING ONLY OFFSITE GENERATED WASTE:	6	9.75 %
FACILITIES MANAGING WASTE GENERATED BOTH ON AND OFFSITE:	16	18.06 %
TOTAL TSD NUMBER AND PERCENT OF WASTE:	60	100 %

TOTAL QUANTITY OF RCRA REGULATED WASTE MANAGED (SECTION IIA/VI): 642,875

HANDLING METHOD	CODE	NUMBER OF FACILITIES USING METHOD (SECTION II)	HAZARDOUS WASTE QUANTITIES HANDLED (SECTION VI) 3/ ONSITE	OFFSITE	TOTAL
			(TONS)		
CONTAINERS	S01	31	1,177	38,473	39,650
STORAGE TANKS	S02	19	1,637	8,267	9,904
OTHER STORAGE	S09	2	0	0	0
TREATMENT TANKS	T01	23	315,766	31,079	346,845
OTHER TREATMENT	T04	8	1,828	82	1,910
TOTAL STOR/TREAT			320,409	77,901	398,310
INJECTION WELLS	D79	0	0	0	0
LANDFILLS	D80	5	7	0	7
LAND TREATMENT	D81	5	709	0	709
OCEAN DISPOSAL	D82	0	0	0	0
SURFACE IMPOUNDMENTS	D83	1	0	0	0
WASTE PILES	S03	9	6,025	50,000	56,025
SURFACE IMPOUNDMENTS	S04	3	2,150	0	2,150
SURFACE IMPOUNDMENTS	T02	0	0	0	0
OTHER DISPOSAL	D99	1	0	0	0
TOTAL DISPOSAL			8,891	50,000	58,891
INCINERATORS	T03	2	2,430	0	2,430
RECYCLING(OPTIONAL)	R01	0	0	0	0
		GRAND TOTAL:	331,729	127,902	459,631

SOURCE: PREPARED FOR EPA BY DPRA, INC. (SURVEY SECTIONS I, II, III AND VI
DATA. DL00350)

1/ SMALL QUANTITY GENERATORS WITH LESS THAN 13.2 TONS/YEAR (1000 KG/MONTH) ARE NOT REPORTED BUT GENERATORS WITH MISSING QUANTITIES ARE INCLUDED.
2/ STATE-ONLY HAZARDOUS WASTE MAY BE REPORTED IN ADDITION TO RCRA REGULATED HAZARDOUS WASTE. THE LARGER QUANTITY IN SECTION IA AND IIIB IS REPORTED TO MINIMIZE MISSING DATA.
3/ MULTIPLE COUNTING OF WASTES BY HANDLING METHOD MAY OCCUR

Source: Prepared by DPRA from the 1985 Biennial Report SAS Data Library.

the State Biennial Program Report (Appendix C) and transmitted to EPA for processing and analysis. This 1985 National Biennial Report and its corresponding 1985 Biennial Report SAS Data Library are the results of that analysis.